

# FireSmart Landscaping

A Guide to  
Protecting Your Home  
from Wildfire



Defensible space in a front yard; a fire prevention patrol Home Ignition Zone assessment; and a lean, clean and green backyard.



*Every year in Ontario, homes are threatened or damaged by wildfire, yet nearly all of the risks could have been greatly reduced if owners had followed a few simple rules.*

*This guide is designed to provide homeowners with the information they need to protect their homes from wildfires through appropriate landscaping techniques. The guide also includes information on what and where the risks from wildfires are, and how individual homeowners can manage their property to minimize the risk of wildfire damage.*

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**FireSmart®**  
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# FireSmart Landscaping

## ***Recognizing Wildfire Risk***

How do you know if you're at risk from wildfire? It is easy to see that a home is at risk from wildfire if it sits in the middle of a woodlot or on the edge of an overgrown field. Additionally, homes are also at risk in what fire experts call the Wildland-Urban Interface (WUI).

The WUI can be anywhere along the suburban fringe. Many densely-developed suburban neighborhoods with four-lane streets and stoplights are at significant risk from wildfire. The WUI can also be small, developed lots around a lake, or small tracts in a forested area. It's hard to say exactly where the risk ends, but having undeveloped woodlands and fields in and around a neighborhood means that residents should know how to prepare their homes for wildfire.

## **Two types of wildfire**

Two types of wildfires – surface and crown fires – can affect homes. Surface fires burn materials laying on or immediately above the ground, including pine needles, leaves, grass, downed logs, stumps, tree limbs and low shrubs. This type of wildfire can surround a home and slowly find vulnerable spots to ignite.

Crown fires move through the canopy of a forest stand, burning from one treetop to the next. They can have extremely high flame lengths, which

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*A crown fire in the tree canopy.*

often start spot fires far ahead of the fire front. Surface fires throw embers as well, although typically not as far as crown fires.

Crown fires can catapult burning embers onto your property, including your home. Crown fires are the most destructive of all wildfires, able to kill mature trees and shrubs, and can move over large areas in short periods of time. Some surface fires, especially grass or marsh fires, can move very fast and cause great injury or even death when they are underestimated. Surface fires can become crown fires in stands where there are "ladder fuels" (i.e. branches that extend to the ground and allow a fire to climb up a tree to its crown).



*A well-managed Home Ignition Zone helps keep wildfire away.*

## ***The Home Ignition Zone***

Homeowners in the WUI should be paying the most attention to producing a safety zone immediately surrounding the home. Wildfire researchers have created the term Home Ignition Zone (HIZ) to describe the area that is more vulnerable to wildfire ignitions. This area typically falls within the FireSmart priority zones one and two (between 0-30 metres from the primary structure). Characteristics of the HIZ determine a home's potential for being ignited by a wildfire.

A well-managed HIZ will cause a crown fire that is approaching the property to decline in intensity due to reduced fuels. As the fire continues to get closer to a home, it will move from the crowns of the trees to the ground and slowly diminish due to a lack of flammable materials. The fire might continue to burn around the HIZ, but the home can remain intact with minimal damage.

It is unlikely that we can prevent wildfires from occurring. The goal of a FireSmart approach is to improve a home's chance of surviving a wildfire with little or no damage.

## **FireSmart Tip**

KEEP YOUR  
PROPANE TANKS  
CLEAR OF  
VEGETATION AND  
DEBRIS FOR  
APPROXIMATELY  
THREE METRES.





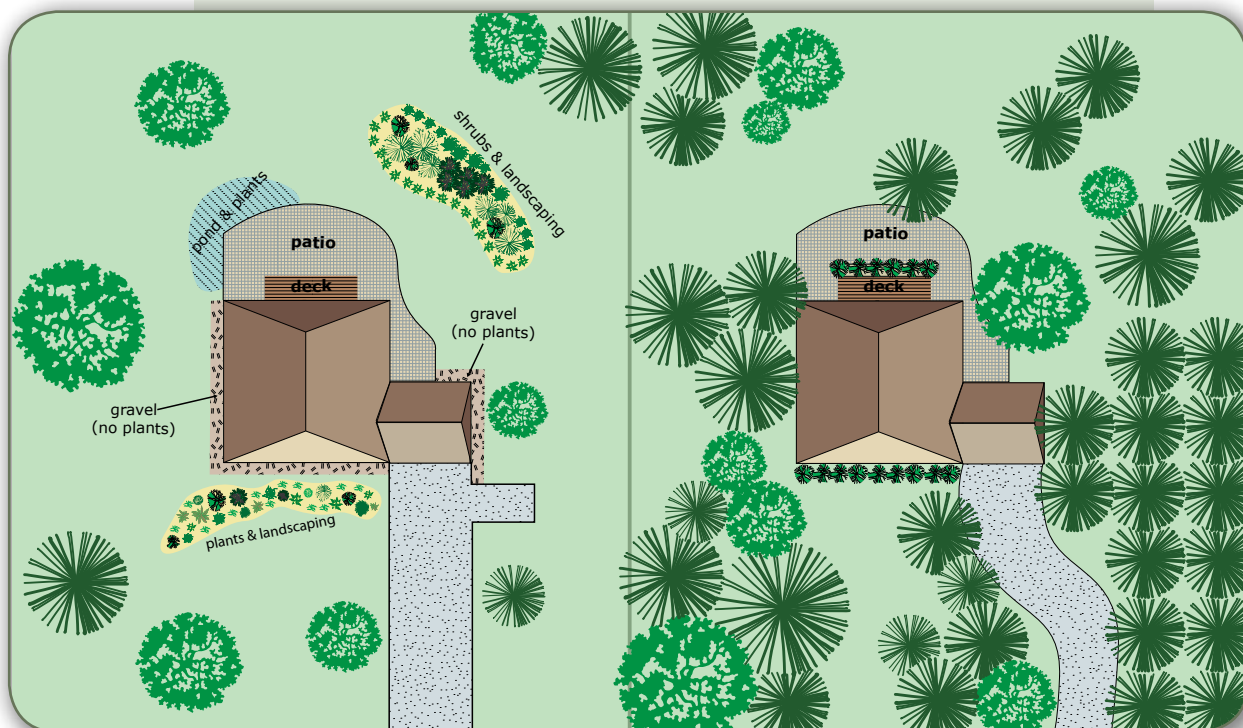


Illustration by Annika Sargent, UW-Extension Environmental Resources Center

*Well-designed landscaping (left) can be attractive and will also help keep fire away. Landscaping that is not FireSmart (right) could allow crown fires and surface fires to reach the house.*

# Landscaping to Protect Your Home

## ***Foundation to Immediate Landscaped Area***

Experts recommend keeping the first one to two metres around the base of the house and any outbuildings completely free of any fuel for a fire. It's easy to understand why tall grasses or evergreen shrubs near the house are risky – when ignited, they could put hot flames directly against the siding and eaves. However, other materials can ignite when dry and should also be kept away from buildings. These include things such as leaves, pine needles, straw bales, and organic landscaping mulch. These materials can host a smoldering fire long after the main fire has completely passed. In fact, a high percentage of homes lost to wildfire ignite well after the most intense portions of the wildfire have passed.

Moving farther away from the house, landscape trees, shrubs and plants should be managed to ensure that any fire in this area remains on the ground and burns quickly (i.e. no smoldering) and with low intensity. That means keeping the lawn clean of fallen pine needles and leaves.



*A one to two metre "fuel free zone" keeps flames away from siding.*

"...A HIGH PERCENTAGE OF HOMES DAMAGED OR LOST TO WILDFIRE IGNITE WELL AFTER THE MOST INTENSE PORTIONS OF THE WILDFIRE HAVE PASSED."

All vegetation should be well manicured, green, and healthy.

Keep the lawn mowed and foliage well watered. In the overall landscaping plan, use plants that are not highly flammable. Low-growing plants with thick, succulent leaves tend to resist fire and are less likely to carry a fire to a building. A number of these plants are highlighted throughout this publication.

Landscaping within 10 metres of your home should not include more than a few scattered evergreens (trees and shrubs that hold their needles all year). Deciduous trees and shrubs that drop their leaves every fall typically burn with much less intensity than evergreens, and are a better choice to plant close to your house. Keep trees and shrubs in this area well pruned and manicured. Tree branches should be pruned to a height of at least two metres from the ground, kept free of dead wood, and pruned away from the roof.

Take care to arrange landscape plants so they are well spaced to prevent fire from moving from one plant to the next. Thin conifer trees so that

the crowns are separated. Avoid planting directly beneath trees, because plants burning in a surface fire might then spread the fire to the tops (crowns) of the trees. Fire burning in the crowns of trees, especially pines, can move rapidly and quickly become very intense.

Managing this area closest to the house represents a significant step in protecting your home. However, the chance that a home can survive a wildfire increases if additional steps are taken for the remainder Home Ignition Zone.

#### FIRESMART PLANT

NANNYBERRY  
*Viburnum lentago*



A common native shrub with white flowers in May and fruit that change from blue to black in fall. The shrub tolerates shade and its fall color is often a vivid combination of oranges and reds. The fruit is sweet and eaten by an array of birds and wildlife.

### ***Beyond the Landscaped Area***

Landscaping practices for the remainder of the HIZ (10-30 metres) should be designed to take away enough fuel from a fast-moving crown fire to slow the fire down, reduce its intensity, and move the fire out of the tree crowns and onto the ground. Simply put, the goals are to:

- ✂ *prevent fire in this area from moving into the crowns of trees, and*
- ✂ *prevent any fire that does happen to reach the crown of a tree or shrub from spreading to the crowns of neighboring trees or shrubs.*

To reduce the possibility of a crown fire, thin trees (and remove some if necessary) to keep them well spaced. This is particularly true for evergreens, which should have at least 5 metres between crowns.

## **FireSmart Tip**

REDUCE  
COMBUSTIBLE  
MATERIALS NEAR  
YOUR HOME BY  
CHIPPING  
BRANCHES AND  
SMALL TREES AND  
COMPOSTING  
LIGHTER  
VEGETATION.



## FireSmart Tip

MAKE SURE YOUR  
DRIVEWAY IS AT  
LEAST FOUR  
METRES WIDE  
WITH A VERTICAL  
CLEARANCE OF 5  
METRES FOR FIRE  
DEPARTMENT  
VEHICLE ACCESS.



*Fire burns faster uphill, making the removal of vegetation farther out essential to slow the fire down.*

Under most conditions, protective measures in a 30 metre zone around a home are sufficient to protect the home from wildfire damage. Fire scientists have shown that large flames of a high-intensity wildland fire typically do not ignite homes at distances greater than 30 metres. A home's materials and design in relation to the vegetation within 30 metres is what determines the potential for a home to ignite.

In all cases, the further out you can maintain the HIZ, the better your chances. This is true for homes built in areas surrounded by steep topography, or if the trees on and around the property are mostly pines.

### Topography and Slope

Wildfires are typically most intense on sloped ground, particularly at the top edge of a hill, because fire burning uphill heats and dries the fuel in its path, causing those fuels to burn more rapidly and intensely. Because of this, the tops of slopes are dangerous places to build a house. People tend to think the Great Lakes region is flat, but even small changes in topography can have significant impacts on fire behavior.

If your house is built on, next to, or closer than 10 metres to the edge of a slope, the HIZ will need to be wider and extend farther down hill, away from your home. This will create a larger, reduced fuel area that the fire will have to move through as it burns uphill toward your house. The longer and steeper the slope around your house, the more the landscaped safety zone should be expanded.

### FIRESMART PLANT

#### COLUMBINE

*Aquilegia canadensis*



This plant blooms from March to July and sets fruit in mid-to-late summer (June to August). Red columbine is pollinated by hummingbirds, hawk moths, and at least four bee species.



## Forests

Conifer forests or plantations located within or close to communities present the most hazardous conditions for forest fires. Species like jack pine, spruce, red pine and balsam fir are known to generate burning embers that can be transported by strong winds up to a kilometre ahead of the fire front. If your home is surrounded by a conifer forest or is built in the middle of a conifer plantation, thin trees and keep them pruned and free of dead wood at least 60 metres from your home. Remove any dead standing trees. These trees can turn into “chimneys” spewing hot firebrands (e.g., burning pine cones, bark or small branches) high into the air. A home fire is possible if firebrands land on areas where leaves, pine needles, or other debris accumulate. These include roofs, rain gutters, under a deck, or along the house foundation. Also remember to check power lines on your property to ensure they are free of overhanging branches.

## Leaf Piles

Raking leaves into the woods can also be dangerous. Leaves in large, deep piles do not decompose as quickly as a natural accumulation of leaves on the forest floor. Dry, burning leaves in a pile can easily be picked up and carried by the wind, and can also accumulate against vulnerable spaces on a house. Instead of piles, spread leaves throughout your forest, take them to a brush collection area, or compost them. Keep in mind that most significant wildfires in the Great Lakes region occur on days with intense winds.

Outside the HIZ, fire can essentially burn unabated without causing a home to ignite. However, it is important to note that most homes do not burn from high intensity fires. Most of the homes lost to wildfire in the Great Lakes region burn either from surface fires in the wake of the main fire front, or from the accumulation of windblown firebrands in advance of the fire. Simply put, FireSmart landscaping and maintenance is critical.



*Pine trees need to be kept well spaced and pruned high.*

### FIRESMART PLANT

Moss phlox  
*Phlox subulata*



A perennial forming evergreen mats of needle-like foliage covered by masses of flowers in various shades of pink, purple, or white that bloom from March to June. Great for rock gardens.

“DRY, BURNING LEAVES IN A PILE CAN EASILY BE PICKED UP AND CARRIED BY THE WIND, AND CAN ALSO ACCUMULATE AGAINST VULNERABLE SPACES ON A HOUSE.”

# Conflicting Values, Desires, and Laws

Some of the FireSmart recommendations presented here may conflict with other values or desires that people have when living in the country or planning for that dream vacation cottage. These include a sense of privacy, the feeling of living or vacationing in a natural landscape, the sense of “getting away from it all,” and not spending a lot of time maintaining the yard and surrounding areas. Common questions include:

- ❧ *If the house is near a lake, is it possible to cut down trees and still maintain a natural and healthy shoreland buffer? (See table of suggested plants below.)*
- ❧ *What happens if the property borders on or includes a native prairie with grasses naturally prone to fire?*
- ❧ *Is it O.K. to keep some trees on the property if they are highly flammable evergreens?*
- ❧ *Does cutting down trees interfere with energy conservation goals?*

## FIRESMART PLANT

### Wintergreen

*Gaultheria procumbens*



A low, woody ground cover with shiny dark green leaves that turn reddish with the advent of cold weather. Small bell-shaped white to pink flowers are produced from June to August, followed by red berries in the fall that may persist through the winter. This leathery perennial has creeping underground stems, thus forming small colonies of plants.

## FIRESMART PLANT

### BEARBERRY

*Arctostaphylos uva-ursi*



A popular ground cover whose name comes from the grape-like fruit it produces. It produces clusters of small, white- to pink, urn-shaped flowers that bloom from May to June. The fruit is bright red to pink that will persist on the plant into early winter. The fruit is eaten by a few species of songbirds and game animals.

## A SAMPLING OF SUGGESTED FIRESMART PLANTS ALSO SUITABLE FOR SHORELAND BUFFERS

PLANT NAME: Common – <i>Scientific</i>	CHARACTERISTICS (orange italics are FireSmart Characteristics)
Swamp Aster – <i>Aster puniceus</i>	0.5-1m tall; showy lavender flowers; <i>low volume of total vegetation</i>
Swamp milkweed – <i>Asclepias incarnata</i>	1m tall; showy pink flowers; attracts monarch butterflies; <i>grows in a variety of wet habitats</i>
Sedges – <i>Carex retrorsa</i> ,	<i>low growing; compact</i> ; stabilizes soil; interesting seed heads
Shooting star – <i>Dodecatheon meadia</i>	0.5m tall; pink flowers with swept-back petals in spring; <i>low volume of total vegetation</i>
Boneset – <i>Eupatorium</i>	0.5-1m tall; showy white flowers; <i>grows in a variety of wet habitats</i>
Joe Pye weed – <i>Eupatorium</i>	1-1.5m tall; showy rose-pink flowers; <i>grows in a variety of wet habitats</i>
Viginia bluebells – <i>Mertensia virginica</i>	0.5m tall; grows in shade; blue flowers in spring; <i>succulent stems</i>
Sensitive fern – <i>Onoclea sensibilis</i>	0.5m tall; <i>grows in a variety of wet habitats; does not form clumps</i>
Bulrushes – <i>Scirpus atrovirens</i> , <i>S.</i>	1-1.5m tall; stabilizes soil; <i>adaptable</i>
Meadowsweet – <i>Spiraea alba</i>	short shrub; <i>deciduous</i> ; showy flowers
Blue vervain – <i>Verbena hastata</i>	0.5-1m tall; showy purple flowers; <i>low volume of total vegetation; tolerates disturbance</i>

- References:
- Shaw, D. and R. Schmidt. 2003. *Plants for Stormwater Design – Species Selection for the Upper Midwest*. Minnesota Pollution Control Agency.
  - Eggers, S. and D. Reed. 1997. *Wetland Plant Communities of Minnesota and Wisconsin*. US Army Corps of Engineers.
  - UW-Extension/WDNR. 1999. *Shoreline Plants and Landscaping*.



Efforts to protect your home from wildfires can also conflict with local by-laws, neighbourhood covenants, or provincial laws. Examples of these include weed ordinances and shoreline management laws. A discussion with the town, city, or planning office is a good place to ask questions as to what can and cannot legally be done on your property. Additionally the Ministry of Natural Resources Fire Management Headquarters can help identify ways to manage your property through the FireSmart program.

## ***Working with prairies***

For those living among native ecosystems that are adapted to occasional wildfires, there are ways to maintain these systems and still protect a home. Restoring prairies has become popular in the region, but landowners need to keep in mind that this is a fire-prone ecosystem. Breaking up large blocks of prairie around a home into smaller blocks will minimize very damaging surface fires. Additionally, focusing on wildflower plantings over grasses, the small blocks of prairie around the house will be even less hazardous and more like gardens. Finally, seeding prairies with species that leave a smaller fuel load on the ground in the fall and spring will reduce the severity of prairie fires.

## ***Managing pine forests***

Many new homeowners build within pine forests and then struggle with maintaining the aesthetic nature of the forest while protecting their homes. Reducing the number of trees around your house and pruning



*A FireSmart yard in a pine forest.*

the remaining to reduce ladder fuels is recommended for fire protection, but changes the habitat for wildlife and the overall character of the property. However, pruning a few select trees and leaving scattered full trees will still provide cover and screening while reducing the danger. Felling trees around your house helps keep large fires from burning right up to the foundation and above the roof. Removing most of the trees very close to the house and gradually

## ***FireSmart Tip***

KEEP YOUR ROOF  
AND RAIN  
GUTTERS FREE  
OF FLAMMABLE  
LEAVES, PINE  
NEEDLES, AND  
OTHER DEBRIS  
THAT CAN BE  
IGNITED BY  
WIND-BLOWN  
FIREBRANDS.





*This raised garden bed is an attractive, low-maintenance, and fire-resistant landscaping choice.*

## FireSmart Tip

KEEP ALL  
FIREWOOD AT  
LEAST 10 METRES  
FROM ALL  
STRUCTURES,  
INCLUDING  
DECKS.



removing fewer and fewer trees as you move away from the house will help maintain a natural look while reducing the fire threat.

To reduce the visual impact of tree removals, a staggered pattern of felling (rather than removing blocks of trees) will leave enough trees to maintain a forest character. Further, replacing some evergreen trees with deciduous trees will increase the visual and biological diversity of the stand and reduce the risk of wildfire danger.

## Energy conservation issues

Planting trees near homes has long been advocated for energy conservation reasons. Deciduous trees provide shade in the summer and allow sunlight to filter through in the winter, and are less flammable than evergreens. Maples are a preferred species for this task because their crowns are very dense and provide the best shade. Energy conservation does not have to conflict with wildfire protection if some simple guidelines are followed:

- ✧ *If planting close to your house seems necessary, plant on the south side of the home because trees planted there will help retain moisture in an otherwise dry area.*
- ✧ *Plant deciduous trees, not evergreens.*
- ✧ *Prune any sprouts from the base of the trees.*
- ✧ *Rake and remove fallen leaves away from the home.*

Remember, with a little thought and effort, protecting your home from wildfire does not have to conflict with other goals, and can enhance the beauty and diversity of your property.

## Looking beyond the property line

When considering wildfire danger, it is also important to consider how the community as a whole fits into the surrounding landscape.

- ✧ *Is there a history of wildfire in the area, and what causes them?*



- ☞ *If a wildfire were to start, in which direction would the prevailing winds likely push the fire?*
- ☞ *Are there large areas of forests or pine plantations located around your community?*
- ☞ *What is the nature of the surrounding topography?*
- ☞ *Would firefighters be limited in their ability to reach your home due to weight limits on bridges, dead-end roads, or a narrow driveway?*

Consider the management of the surrounding lands. Are the forests, grasslands, and marshlands in your area actively managed to keep the landscape healthy and productive? If not, you might want to contact neighboring landowners to encourage them to use fuel reduction techniques to reduce wildfire risk.

## Cooperation between neighbors

Residential developments within the wildland-urban interface often include a higher density of housing than typically found in more rural areas. In these cases, an individual's Home Ignition Zone might overlap that of a neighbor's. In these developments, if one property owner does everything possible to improve the condition of their property and the



*In many localities, good fire prevention requires cooperation among neighbors.*

neighbor does nothing, the neighbor's fuel load might be enough to cause the loss of both homes. Talk to neighbors about wildfire safety and make a plan to work together to reduce the wildfire risk. Wildfire does not pay attention to property lines!

Some housing developments include areas of wildland vegetation

commonly owned by everyone in the development. These could be wooded areas between houses or "greenbelts" on the outskirts of a neighborhood. These greenbelts are kept open around a community to create a boundary for development while preserving natural, agricultural, recreational, and scenic values beyond the developed area.

Work with neighbors or a neighborhood association to keep these common areas thinned, pruned, and healthy. If these areas are left unmanaged and fill in with dense vegetation or down and dead wood, the overall wildfire hazard of the community greatly increases. Ideally, fuel reduction practices are built into subdivision covenants.

"TALK TO  
NEIGHBORS ABOUT  
WILDFIRE SAFETY  
AND MAKE A PLAN  
TO WORK  
TOGETHER TO  
REDUCE THE  
WILDFIRE RISK."

### FIRESMART PLANT

Ninebark

*Physocarpus opulifolius*



A common native shrub that produces flowers and fruit from May to July. The clusters of white flowers in the spring are an excellent nectar source, and the red fruits in the autumn are eaten by many species of birds.

### FIRESMART PLANT

Wild Geranium

*Geranium maculatum*

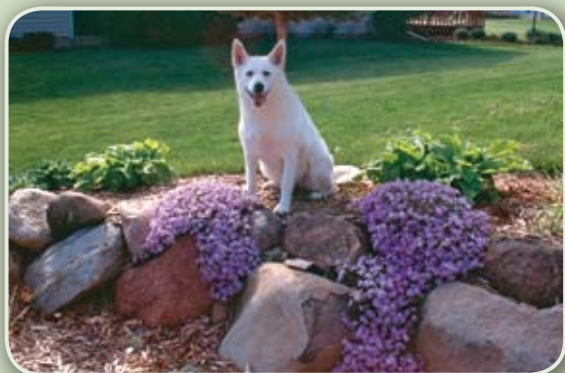


This plant blooms from April to July, and the nectar and pollen of the flowers attract a variety of bee species, small butterflies, and other insects.

# FireSmart Landscaping



*Garden "islands" keep plants isolated and away from your home's siding.*



*Rock walls are another creative, FireSmart landscaping choice.*



*FireSmart landscaping can be both effective and attractive. This pond beautifies the lawn and provides additional fire protection.*



*The Great Lakes Forest Fire Compact*  
Michigan – Minnesota – Wisconsin – Ontario – Manitoba

## **FireSmart Landscaping – A Guide to Protecting Your Home from Wildfire**

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